FARMERS' BULLETIN 614

A CORN-BELT FARMING SYSTEM WHICH SAVES HARVEST LABOR BY HOGGING DOWN CROPS

J. A. DRAKE
Agriculturist

UNITED STATES
DEPARTMENT OF AGRICULTURE

WASHINGTON : GOVERNMENT PRINTING OFFICE : 1926

LABOR and the maintenance of fertility are two of the more serious problems of the average corn-belt farm. This bulletin gives the details of a system of farming efficient in meeting both. By this system farm labor in general is distributed well throughout the year, and harvest labor is reduced to a minimum by hogging or pasturing off all or a large part of the three main crops—corn, rye, and clover. This process of harvesting not only saves much labor at rush seasons but keeps up soil fertility.

Washington, D. C. Revised March, 1917

A CORN-BELT FARMING SYSTEM WHICH SAVES HARVEST LABOR BY HOGGING DOWN CROPS.

CONTENTS.

THE system of farming herein outlined provides productive labor for practically the entire year and at the same time so distributes this labor as to make it possible for one man, practically without hired help, to handle a large acreage, making a net income considerably greater than is at present commonly obtained on farms of similar size in the corn-belt States (fig. 1). This system rapidly increases the productiveness of the land and is designed to conserve soil fertility to the greatest possible degree. It affords a solution for some urgent and difficult farm problems.

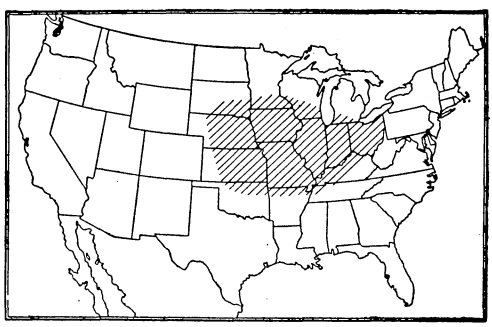

FIG. 1.—Map of the United States showing, by shaded lines, the territory to which this bulletin is applicable.

Labor in itself constitutes one of the hardest problems encountered on the average farm. Not only is this now true, but the situation seems to be growing more serious each year. The cost of extra labor is becoming greater, and efficient labor on the farm is more difficult to secure when needed most. Transient labor for the general farm is very unsatisfactory. As a rule, also, it is not convenient or profitable to keep the necessary extra labor throughout the entire year, even if it were available. This condition must soon result in the reorganization of a large number of farms throughout the corn belt, and in other sections as well. The main features of these changes must be (1) a better distribution of labor throughout the entire season and (2) systems that will reduce the extra labor required at certain critical seasons of the year to a minimum.

The average corn-belt farm must be devoted largely to the growing of staple field crops, such as can be planted and cultivated by machinery and handled on a large scale. There is little place in that

NOTE.—This bulletin was prepared originally in the Bureau of Plant Industry and published Nov. 13, 1914.

region for crops that yield a big income per acre, such as truck crops and small fruits, except in a few localities close to cities, where good markets are available. The tendency in most sections is for the labor of the farm to be done by one man or by one man and his family. Occasionally it is done by the owner or tenant and a hired man. In this case it is rare that the hired man can be depended upon to stay the entire year, unless he has a family and is furnished a place to live. In any event, it is growing more imperative that the efficiency of the one man be increased as much as possible in such operations as plowing, planting, and cultivating the farm crops, and that all the labor possible be eliminated in the harvesting of these crops, in order to cover a greater acreage effectively and at the same time to use the greatest economy in the employment of outside labor, inasmuch as it is so difficult to secure.

Already this has given rise to certain well-formed and definite systems which include these elements as prominent features in the management of the farm. In several widely separated places practically the same system has been worked out. In all of these instances 3 and 4 horse machinery is being rapidly substituted for that of the 2-horse type, in order to double the efficiency of each man employed. Crops are being grown that do not compete for labor. Live stock is being used in every way possible in the harvesting of the crops produced, thus eliminating to a very great extent the necessity of hiring extra labor. By this process, also, the soil is being brought to a higher stage of productiveness.

THE CROPPING SYSTEM.

A system which meets the requirements of the average conditions in the corn belt has been found in actual operation on a number of widely separated farms. It is one of the most definite and clearly defined systems that have been encountered during several years of farm-management studies throughout the region. It has been devised by the farmers themselves, as they have been forced gradually to meet present conditions.

The system in itself is very simple. Only three different crops are grown, and these follow in a 4 or 5 year rotation that is easily managed. The crops are corn, rye, and a mixture of clover and timothy, or clover alone, as is thought best. The rotation in its 4-year form is corn, corn, rye, and timothy and clover. The 5-year rotation is the same, with the exception that the clover and timothy are allowed to stand two years instead of one.

The ease with which the labor of such a rotation is taken care of is very evident. Corn is the first and only crop to receive attention during the spring and early summer until time to lay it by, at which time hay harvest begins. Since the rye is harvested later by the

hogs, there is nothing to correspond to the wheat harvest, which always comes at about the time the corn crop should be given its last cultivation. Haying, then, is the only job to look after from the time the corn is laid by until it is necessary to cut corn or sow the fall grain, which in this case is rye. Thus the program is not crowded, and each crop can have its due attention without rushing or slighting any part of the work. This makes it possible for a given crew to handle a maximum acreage with the least possible expense for outside help.

In order that a clear and definite understanding may be had of the entire system, its rotations, the layout of the fields, and the methods of handling the live stock, a diagram with fields numbered and crops indicated is presented herewith (fig. 2).

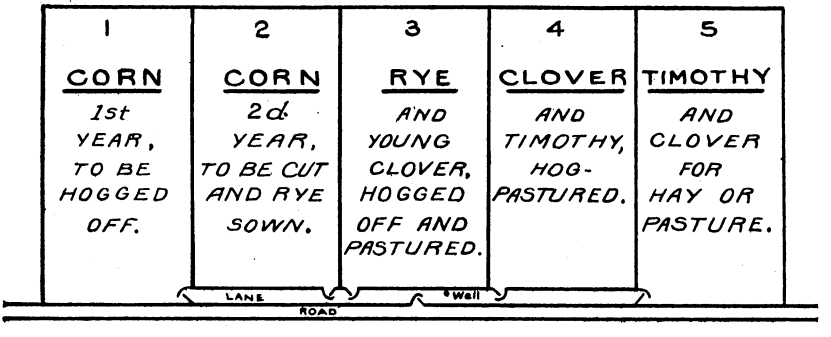

FIG. 2.—Plan of a farm run on a 5-year rotation.

This drawing represents an actual farm as it is being operated, with the exception that one field is left in permanent pasture. Thus, the real farm is being run on a 4-year rotation, but for the sake of illustration it is shown on the 5-year plan, which, everything considered, is probably the most desirable. This depends somewhat on the size of the farm. If the farm is of sufficient size, a sixth field may well be added and devoted to permanent pasture.

As the crops are arranged in the drawing, the rotation moves one field to the right each year. The details of the crop management are as follows:

Field No. 1.—The crop in field No. 1 is first-year corn, or corn the first year after sod. This corn is grown and hogged off as soon as it is ripe. This process generally begins as soon as the corn has become hard and as soon as the hogs can be brought up to full feed, or about September 1 to 10. On some farms the commendable practice is followed of sowing soy beans or rape, or both, at the last cultivation of the corn, in order to furnish pasturage for the hogs while gathering the corn crop. Generally this will furnish a large amount of forage, and it is valuable not only on this account, but because of the humus-forming material it affords that will be turned back into the soil. The success of this practice depends somewhat on local conditions, but it comes in so nicely with the hogging down of the corn and requires so

little labor that it is worth a thorough trial. The following spring the stalks and trash that remain on the surface of the field are cut over with a sharp disk. This is the first step in the preparation of this field for the second-year corn to follow.

Field No. 2.—Field No. 2 is devoted to second-year corn, or corn following the year previous. Rye must be sown here in the fall in order to furnish a field of rye for the next season, which, in turn, affords a ready means of getting a stand of clover and timothy. If it is a normal season and the corn stands well, the rye may be sown in the standing corn with a 1-horse drill. If this is not possible, the corn must be cut as early as is allowable, the ground prepared, and the rye sown after the corn has been cut and shocked. If corn cutting comes late, the rye may be sown late also and still give very good results. Rye may be sown much later than wheat with much more certainty of success. In some instances it is sown so late that it does not come up until the next spring, and still it produces a fair crop. This, however, is not desirable if it can be avoided.

Field No. 3.—Field No. 3 is devoted to rye during the entire season. I n the fall of the year previous, timothy is sown with the rye, and the clover is sown in the rye early the next spring, preferably in February. During the spring the rye is pastured by the hogs as long as it is palatable. It affords excellent pasturage, which is quite valuable for young hogs and brood sows. As soon as it becomes tough the hogs will begin to chew it for the juices and throw the remainder out on the ground. This is a sign that they have derived about all the benefit they are capable of getting from the green pasturage. They are then taken out and are not returned to the field until about two weeks after the rye has ripened. Then they are allowed to gather the entire crop of rye and graze on the young clover that has come up from the spring seeding. The hogging down of rye is discussed in full later under the heading "The rye crop."

Field No. 4.—The clover and timothy in field No. 4 in a 5-year rotation are devoted entirely to hog pasture. Where this plan is used with a 4-year rotation, as is often done, the grass crop on this field must furnish both pasture for the hogs and hay for the horses and for the cows kept for family use. Hence, it is seen to be an advantage to sow a mixture of clover and timothy instead of clover alone. The hogs graze principally on the clover and leave most of the timothy to be cut for hay. A good cutting of mixed hay can generally be taken from the best parts of the field. This will usually be sufficient for the horses and cows.

Field No. 5.—The clover and timothy in field No. 5 occupy the ground for the second year. It should be nearly all timothy, though sometimes a good deal of clover may be present also. The grass crop on this field is cut for hay and may be sold. Late in the fall it is plowed for the first-year corn, which follows the next year. If not pastured too closely, this affords an excellent opportunity to plow under a good second growth of grass that will be very beneficial to the land.

THE SYSTEM OF LIVE-STOCK MANAGEMENT.

The principal live stock to be kept on a farm using this system is swine. The fall pigs are turned in on the rye in field No. 3 as early in the spring as is permissible. This is generally from April 10 to 15.

The sows and their spring litters are turned out on a part of the rye field or a small bluegrass pasture as soon as the pigs are old enough to travel well and are approaching the weaning age. When they are from 6 to 8 weeks old they are weaned and the sows taken to other inclosures, where they are bred for fall litters.

The fall shotes and the spring pigs remain on the rye as long as it is tender and succulent. This varies somewhat with the season, but generally throughout the corn belt the rye has become so woody by May 1 to 15 that it no longer affords good pasturage, and at this time the hogs are turned from the rye field, shown in the illustration as field No. 3, into the first-year clover and timothy in field No. 4. There they receive a reasonably liberal corn ration.[1] This is continued until fully two weeks have elapsed after the rye has ripened in field No. 3. This is generally about July 15. At this time the young hogs, and very often the brood sows also, are all turned into the ripe rye and allowed to hog it down and to eat the young clover along with it. While engaged in this operation they are given no corn or slop feeds whatever, and the only attention they require is to be given plenty of fresh water.

As a working basis on which calculations may be made, it has been found that six 100-pound hogs to the acre will gather a 17-bushel per acre crop of rye in six weeks. Timed in this way, the hogs will have the average rye crop harvested by September 1, at which time new corn is about ready to feed. Then, as soon as the hogs can be brought up to full feed on the new corn, or about September 10, they are turned into the first-year corn in field No. 1. There they remain until the field is hogged off or they are sold. This will be about November 1 to 10 if all the hogs are kept until the entire crop is gathered.

Many who have followed this system have found it advisable to take the fall shotes out of the rye and clover field about August 15 and allow them to finish out on old corn, thus getting them on the market before the rush of new-corn hogs. In this case the spring pigs are allowed to continue gathering the rye, and if any is left when they are turned into cornfield No. 1, the brood sows are turned in or are left in the rye field to clean it up.

Thus, the whole herd is furnished pasture and grain feed throughout the entire spring, summer, and fall, which the hogs have gathered with practically no labor and very little attention on the part of the owner or the man who operates the farm. Besides this, the brood sows and the fall litters are furnished pasturage on the rye field during the fall and early winter of the same year it is sown.

For the winter feeding of the fall pigs it is desirable to sow a few acres of soy beans. This may be done in the second-year cornfield or

[1] Two or three pounds of shelled corn (5 or 6 average ears) for each 100 pounds of live weight is about right.

on some small field set apart for that purpose. The most practical method of feeding this crop is to cut and stack the beans when ripe and feed them out as hay. Racks may be provided or they may be fed on the ground. The pigs are very fond of them, and if they are not fed in too great abundance none will be wasted. Soy beans fed in this way with corn make one of the most satisfactory winter feeds that can be grown or purchased on the market.

It may be desirable in some instances to enlarge on this farm system so as to include cattle or sheep or both in the live stock kept. This may be done by adding a sixth field to the plan proposed and allowing it to remain in permanent pasture. Dairying might be introduced into the system in localities favorable to this enterprise. If this is done, enough cows should be maintained to keep a second man practically busy with their care and management, since the crops and hogs keep one man well employed. Another live-stock enterprise suitable for combination with the system here outlined is the keeping of brood mares to do the work and raise colts. With any of these additional live-stock enterprises the farm should be of sufficient size to permit the sixth field to remain in permanent pasture and still allow the other fields to be of good size.

THE SIZE OF THE FIELDS.

In carrying out this system to the best advantage, the fields should not be less than about 20 acres. In a 4-year rotation this would call for 80 acres of tillable land and would just about represent a 1-man 3-horse farm in this latitude. In the 5-year rotation plan it would call for 100 acres of tillable land, and this could still be handled with the same working force. The sizes of the fields may be increased up to 40 acres, beyond which it is doubtful whether the acreage should be extended. If the fields are made to include 40 acres on the 4-year plan, it would call for 160 acres of tillable land, and on the 5-year plan there would be 200 acres in the rotation. If one field should be added and the same size maintained, there would be 240 acres in all. With this sixth field left in permanent pasture, the entire farm can be handled by one man with the assistance of a hired hand during the summer, provided he is equipped with a good 4-horse team and all machinery to correspond. The only extra labor that would be required would be while putting up 40 acres of hay and cutting and husking 40 acres of corn. If modern machinery is used, but little extra labor will be required, even for these operations.

By plowing one of the fields for corn late in the fall, such a plan is perfectly feasible, and there would be no rush season when the work could not be managed with a reasonable degree of comfort. To carry this out, it would be necessary to have the sows farrow their spring litters early in March, so as to require very little attention

after the season for field work opens. The fall litters should be farrowed about September 1, as this is another time of year when work would not be pressing.

It will be seen that this system of managing a farm is capable of great possibilities in extending the area that one man can handle. For small farms it probably has less value, but it fits well into any scheme of farming medium and large acreages. It is especially suited to farms on which the labor conditions are difficult to meet and to farms that are in a low state of fertility. The method of disposing of half the corn and all the rye is such that it builds up the soil rapidly, and the labor saved in allowing the hogs to harvest these crops and a great part of the clover is a very important advantage over the ordinary system.

THE RYE CROP.

One of the very distinctive features of this farm system is the rye crop and the part it plays in the general details of management. There is no other crop that will fit in so well as rye and none that will take its place in carrying out this system in its most desirable form in the corn belt. In the first place it is a fall grain, which is absolutely necessary in order to get the most desirable distribution of labor. Wheat might fill this requirement, but there are many features about wheat that make it very much less desirable for this purpose than rye. Wheat is less certain to yield a good crop, and rye can be sown much later in the fall, if necessary, with greater assurance of success. Wheat can be hogged down in small acreages as well as rye, provided it is eaten quickly, before it has time to waste. The straw of wheat will break near the ground and allow the grain to lie flat on the ground, whereas rye straw breaks higher up and near the heads and thus keeps the grain off the soil, preventing it from rotting before the hogs have had time to gather it. When allowed to stand after it is ripe, wheat will shatter out, while rye will be retained in the heads until very late in the fall or early winter.

There is some objection to rye when used as outlined in this system in the dry regions of the West, on account of the grain remaining so hard that the hogs will not eat it, and, therefore, wheat for such sections is more desirable for hogging down than rye. But in the corn belt there is no trouble of this kind, provided the rye crop is allowed to stand in the field unmolested for a period of two weeks after it is ripe. When this is done, the beards lose their sharpness, the grain softens and becomes more palatable, and the hogs waste no time in taking hold of their new feed. This wait of two weeks is absolutely necessary, or there will be great disappointment in the hogging down of rye. Many have condemned the practice merely because this precaution was not observed. Another mistake that is often made is to

feed corn when the hogs are gathering the rye, thinking that thereby their growth will be hastened. After the hogs have been on the rye for a few days the corn ration should be gradually lessened until none is fed. If corn is fed, the hogs will simply eat that much less rye.

Rye possesses other advantages over wheat. Aside from being a more certain crop, rye will do better on poor soil than wheat. In many sections of the corn belt wheat is hardly a profitable crop, and many farmers say they grow it merely in order to get a stand of clover and are inquiring what they must do to get away from raising wheat. Rye, when managed as it is in this system, offers a solution of this problem. It not only takes the place of the wheat crop where the yield of wheat is low and unprofitable, but it offers a better chance of success with the clover crop that is sown in it. Rye grows tall and does not produce so dense a shade as wheat, and it therefore gives the clover a better opportunity to thrive.

In carrying out this general plan with the rye crop it is the most common practice to pasture it with the hogs for a while during the early spring. This is not only a beneficial thing for the hogs, but their trampling helps to sink the clover seed into the soil and is an important item in securing a stand of clover. Figure 3 shows a good bunch of pigs grazing on rye early in the spring and the splendid pasturage they are getting.

Another important feature about the practice of hogging down rye which must not be overlooked is its contribution toward the building up of the soil and the maintenance of soil fertility. All the rye straw and practically 80 per cent of the fertilizing value of the grain is

FIG. 3.—Hogs grazing on rye in the spring.

FIG. 4.—A splendid growth of rye, with the hogging-down process just beginning.

immediately put back on the field and is better distributed than would be possible by any other system of feeding and distributing the manure. It is possible, even on poor land, to produce immense growths of rye straw with fair yields of grain. This straw furnishes great quantities of the vegetable matter and humus-forming material that is so essential to all soils. The crop of rye shown in figure 4 was grown on only medium soil with the aid of 200 pounds of acid phosphate per acre. Turning back such quantities of straw soon makes a decided change, even on very poor soil.

An item of no little importance is the ease with which the hogs take care of themselves while hogging off the rye crop and eating the young clover that has grown up therein. During the hot season of July and August the hogs lie in the shade during midday, but about sundown start out in the rye field and work there generally all night, coming in late the following morning. If plenty of pure water is furnished them, this is all the attention they require, and they will continue to do the work of harvest hands very effectively.

Compared with the cost of harvesting, thrashing, and marketing the grain it has been determined that each hog will do about 1 cent's worth of work per day. This, taken into account with the fact that each hog will make a very creditable gain of one-half to three-fourths of a pound per day, and in some cases a pound, during a time when the labor situation is most tense, is a big factor in the economic management of the farm.

The composition of rye grain is about the same as that of corn, being only slightly higher in protein than corn. Young clover, when eaten with ripe rye, makes an excellent ration, which produces a smooth, "growthy" type of hog that is in just the right condition to put on fat rapidly when given a corn diet later.

Figure 5 shows a rye field that is nearly harvested and the splendid hogs that it has produced.

THE MONEY INCOME PER ACRE.

The money value of an acre of rye, whether hogged down or thrashed and sold on the market, is not great; hence, on smaller farms of 40 to 60 acres of fertile soil this crop with this method of management will not have so much place as on larger farms that are less productive. On the smaller farms it is desirable to grow crops that will bring a greater profit per acre, even though a greater outlay of labor is necessary. If, however, this demand for extra labor can not be met, then rye and the practice of hogging it down still have a place on the smaller farm, and especially if such farms are in a run-down condition.

Under average conditions in the corn belt 17 bushels of rye per acre is a good yield. This, when sold on the market at 70 cents per bushel (which is a liberal standard price), will bring $11.90. The income when the crop is hogged down will vary with the price of hogs. With the young clover that grows up in the rye, a 17-bushel acre of rye will produce approximately 200 pounds of pork without any outside or supplementary feeds. This, when sold at 6 cents per pound, will bring $12 per acre, and at 7 cents, $14.

FIG. 5.—A field of rye and young clover nearly hogged off and the thrifty hogs that have been doing the work.

In collecting data on the income derived from an acre of rye when hogged down, it has been repeatedly shown that this is about the same as when the crop is cut, thrashed, and sold. Generally, there has been a slight advantage in favor of the hogging-down process. This varies somewhat, and in some cases this advantage has been considerable. In addition to yielding an equal or slightly greater money income, the hogging-down method permits the rye to stand throughout the hot, dry season and come down gradually, thus furnishing a protection for the young clover; it saves the labor involved in harvesting, thrashing, and marketing the crop, and is a very important means of building up the soil. Even if the two methods yield the same financial returns, that of hogging down the crop is decidedly superior, in that it protects the clover, builds up the soil, and saves the labor of harvesting, thrashing, and marketing the grain.

RYE OR WHEAT—WHICH?

There may be some question when this farm system is considered for the average corn-belt farm as to whether it is not better to continue growing wheat than to substitute rye with the practice of hogging it off. This is a question that must be worked out and answered separately on each farm.

In deciding this question there are many things that must be considered. The first is the man himself. Has the man who will operate the farm an inclination toward swine raising or a dislike for it? Has he or can he acquire sufficient skill in this to be reasonably sure of raising the number of hogs each year that would be required to harvest the rye crop? The next item is the equipment and fences on the farm. Is the farm so fenced or can it be so fenced that hogs of all sizes may be kept in all fields? Certain equipment for housing the brood sows and their litters will be necessary also. Is it desirable to furnish the fence and other equipment necessary, or continue more along crop-farming lines, of which wheat growing and selling shall be a part? Finally, the item of labor must be considered. Is there labor available to handle the wheat crop without seriously hindering the other farm operations? If not, even if it is more profitable, it may be advisable to substitute rye and the practice of hogging it down.

THE CORN CROP.

The corn crop is a very important factor in the success of this system. On farms where corn yields are extremely low this plan would require the purchase of a large amount of corn, and it might not be feasible until the soil has been built up to a point where a fair yield of corn may be expected. It might be better in such cases to run the farm as a grain farm, with such legumes as soy beans or cowpeas as cash crops, until the soil has been built up to at least a moderate degree of fertility by this means and by the use of such green

manures and other soil amendments as the farmer can afford under the circumstances. An alternative would be to reduce the number of hogs in proportion to the corn yield, say to three or four for each acre of rye, instead of six. By doing this the rye will last longer and less corn will be required.

The possibility of securing at least fair yields of corn should be kept in mind in putting this plan in operation outside of the corn belt proper. With the precautions mentioned above, this system as a whole, or modifications of it, should be of value in the reorganization of a large number of farms in other sections as well.

The system proper should always include two fields of corn, as shown in figure 2. One field should be cut and shocked and later shredded, in order to furnish bedding, while the fodder is being fed in the barn. All or a part of the other field should be hogged down as it may seem wise to do under the circumstances at hand. All the fields in the rotation should be of approximately the same size. With this arrangement and corn yielding 60 bushels per acre, ample corn will be produced to meet the needs of the farm. If the yields are lower than this, the number of hogs must be cut down accordingly, or the difference made up by buying corn.

The practice of hogging down corn which is called for in this system of management is so prevalent throughout the corn belt that it is not necessary to discuss it at length.[1] Farmers have learned that when properly handled it is a most successful and profitable farm practice. It is not wasteful, it saves a great amount of labor during a rush season when outside labor is badly needed, and it immediately returns to the soil most of the fertility contained in the corn crop. In addition to this, by plowing down the cornstalks and the remaining vegetation left by the rape and soy beans sown in the corn, a large amount of vegetable matter is turned under, which is very important if crop yields are to be increased and maintained.

The general experience is that a part of the field should be set off by a temporary fence[2] and that the hogs should not be allowed to cover too large an area at one time. This precaution is a big factor in preventing waste, and it avoids the possibility of having to leave the field only partly gathered if it should become necessary to sell the hogs before the work is finished. This is especially desirable with this system, since only six hogs are to be raised for each acre of corn to be hogged off. In this case, it will take the six hogs, three of which will be fall shotes and three spring pigs, about 60 days to hog off an acre of corn yielding 60 bushels. Very often it may not be desirable to allow the hogs to cover more than one-half or two-thirds of the field. It would seem advisable, therefore, to fence off from 5 to 8 acres

[1] For a full discussion of the practice of hogging down corn, see Bulletin 143, Iowa Agricultural Experiment Station, and Bulletin 104, Minnesota Agricultural Experiment Station.

[2] This fencing is easily done by setting good anchor posts at each side of the field, stretching 25-inch woven-wire fence, and tying it to the hills of corn.

at a time and have this cleaned up well before moving the fence. It is good practice also to allow the brood sows and their fall litters to follow later to gather up what little waste corn may be left in the field.

When the hogging down of corn, properly managed, is combined with the hogging down of rye and the pasturing of clover, as outlined in this paper, the result is one of the most economical and efficient of farm systems and one that will meet many of the most urgent farm problems in the corn belt.

THE SOURCES OF INCOME.

It is evident that the principal income from this system is to be derived from the sale of hogs. In addition, there will be a calf or two for sale each year. The hay needed for the horses and cows will be cut from the hog pasture shown as field No. 4 in figure 2. This will permit the sale of all the hay cut from field No. 5.

THE LABOR PROBLEM.

One of the most striking features of this system is the way it meets and solves the labor problem. The chief aim has been to grow only those crops that do not compete seriously for labor, to eliminate as much labor as possible at the rush seasons by the harvesting of crops with live stock, and so to distribute the necessary labor throughout the year as to enable a given crew to handle a maximum acreage with the least possible amount of outside labor. How effectively this is accomplished is shown by the accompanying chart (fig. 6), which shows graphically the amount of time available for field work throughout an average season and the amount of work of this character that is required during each month on a 100-acre farm run by this system. Figure 7 shows the additional labor required to take care of 10 brood sows and their litters under this system of management.

The labor on the 100-acre farm, as charted in figure 6, is done by one man and three horses, with a very small amount of outside help. The crops are two 20-acre fields of corn, 20 acres of rye, 20 acres of clover and timothy, and 20 acres of timothy. The labor indicated in figure 6 also includes the growing of two acres of potatoes. By plowing one field for corn in the fall the one man and three horses are able to handle all the spring work within the limits of available time, get the corn in, cultivate it, and produce the crop without assistance. The next operation is that of putting up the hay, and even with the most modern haying machinery some extra labor is needed.

As previously stated under "The system of live-stock management," the hogs are turned in on the rye field (fig. 2, No. 3) about July 15 and allowed to harvest that crop. On account of this the man and his team are practically relieved from field work after the hay is put up until early in September, when one field of corn must be cut and 20 acres of rye sown. The harvesting of the hay will be done

by the last of July, and, with the possible exception of a day or two during August in finishing the haying job, there will be no field work to be done from then until the second 10-day period of September, when corn cutting begins. Thus, there are about five weeks when the man and his team would be idle, but this is thrashing time and he can help his neighbors and do the work indicated in figure 6 as extra labor, in order to pay back the labor he would be forced to hire when shredding a part of the 20 acres of corn in field No. 1 of figure 2, this being necessary to provide bedding in the barn. While extra labor to the extent of 16 extra hands and 6 extra teams is shown in figure 6 during the last 10 days of October for

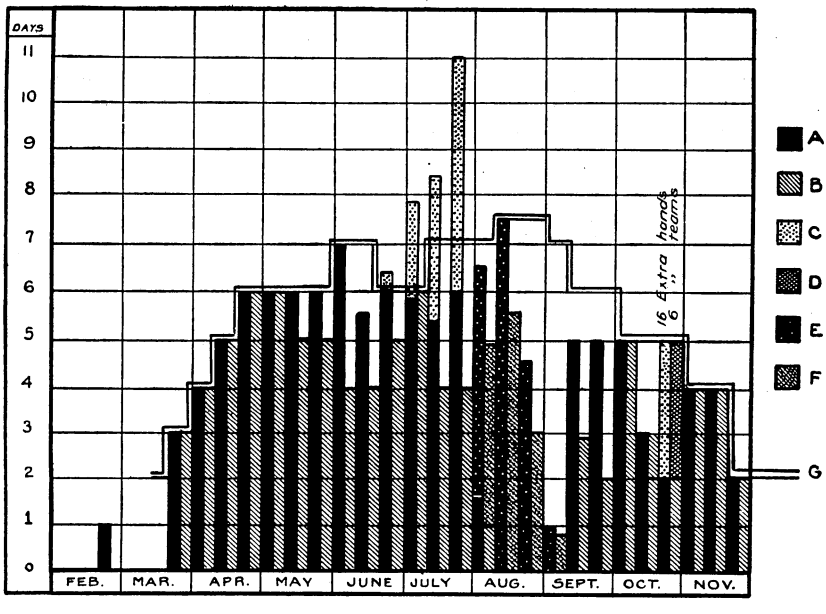

FIG. 6.—Diagram showing the distribution of labor for one man and three horses on a 100-acre corn-belt farm when run on the plan described in this bulletin. Explanation: A=man days, B=3-horse team days, C=extra man labor, D=extra horse labor, E=exchange man labor, F=exchange horse labor, G=available time for one man and three horses.

doing the shredding, this labor is paid for during August and the first 10 days of September by helping these men in thrashing their wheat and oats.

With the extra labor taken care of in this manner there will still remain about 10 days of extra labor during hay harvest that must be paid for in cash. With this small amount of hired help and the assistance of the hogs in harvesting the 20 acres of rye, 20 acres of corn, and the greater part of 20 acres of clover and timothy, one man and three horses can do the work on a 100-acre corn-belt farm.

Figure 7 shows the labor required in the care of 10 sows and their litters during the entire year. This must be done in addition to the regular farm work. A glance at figures 6 and 7 will show how well the labor required by the hogs fits in with the other farm operations

and helps fill in the program during slack periods of the regular work. During the winter months there is little work the farmer can do profitably, and it is during this season that the heaviest work is demanded by the hogs. At this time there should be 60 fall pigs, 10 brood sows, and 1 boar to care for, feed, water, slop, bed, etc. The amount of time actually put in at this will vary with the man and the arrangements for handling the hogs. The fall pigs should be divided into two or three lots, according to size. If these are scattered somewhat and the feeding done out of doors, portable shelter houses being used both for the shotes and the sows, more than 4 hours a day will be necessary. If the shotes are allowed to run together in one herd and are housed in a large, permanent house and the sows kept together in a part of the same building, less time

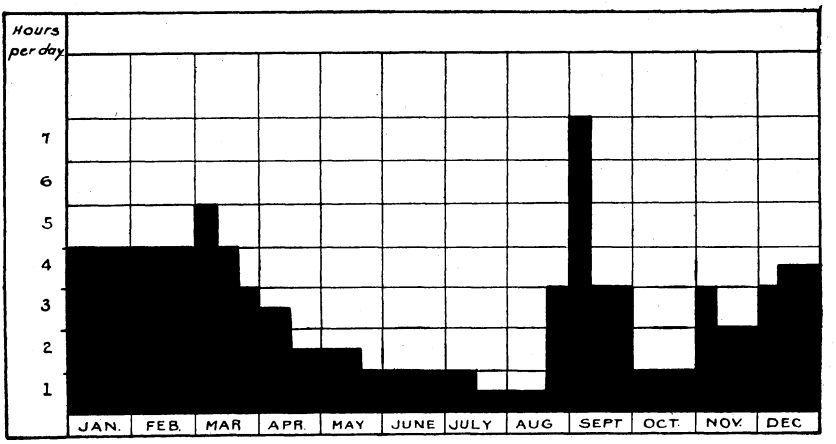

FIG. 7.—Diagram showing the amount and distribution of labor required by 10 brood sows and 120 pigs by the system of management described in this bulletin.

will be required. Under ordinary conditions 4 hours a day will be required for this work throughout the corn belt for the winter months.

The two litters of pigs produced each year are farrowed between March 1 and 15 and September 1 and 15. This accounts for the extra amount of work with the hogs at these two periods. A glance at figure 6 shows that at these periods the farmer has practically no field work to do and can well devote his time to the care of the sows and their young litters, together with whatever attention the shotes may require. From September 1 to 15 there is more work to be done in connection with the hogs than at any other period of the year. During this time the fall litters are farrowed and the shotes are fed corn in order to get them on full feed before turning them into the cornfield which is to be hogged down. For a few days old corn is fed, but gradually new corn takes its place. This is gathered from the field, and still further increases the labor at this time. This constitutes the busiest season of the year for this kind of work, but it comes when there is the least amount of regular farm work to be done.

It will be seen that the hogs are an effective means of cutting down the labor at rush seasons, of avoiding the expense and annoyance of securing much hired labor, and of transferring the bulk of this labor to other seasons of the year, when the farmer can do the work himself. By following a system of this kind the amount of outside or extra labor needed is extremely small. Aside from the saving in money, this independence of outside circumstances is desirable.

SUMMARY.

Labor is the most difficult problem to meet on the average corn-belt farm. This condition is growing worse instead of better and will probably make it necessary to reorganize a large number of farms in that section. Unless systems of farming are adopted that will eliminate a part of the work required at rush seasons, it means cutting down the acreage that each farmer can handle and the net income as well.

By force of necessity many farmers throughout this section have devised such a system and have formulated about the same rotation and general plan of operation. The fact that they can plant and cultivate more crops than they can harvest has led them to resort to gathering much of their crops with live stock and to planting such crops as will lend themselves to this mode of harvesting. The possibilities of saving labor and extending the acreage, and thus increasing the income, by this method are only beginning to be realized.

Swine are a class of live stock admirably suited to solve this particular farm problem. These animals most successfully and profitably harvest the greatest variety of farm crops. Rye, corn, clover, soy beans, rape, and other forage crops that can be grown in the corn belt are harvested thus with a maximum of profit and a minimum of labor to the farmer.

Rye and the hogging off of this crop offer a substitute for wheat, which has become unprofitable on many farms of this section. Under ordinary conditions a price greater than that given for rye on the market is obtained, and all of the rye straw and about 80 per cent of the fertilizing value of the grain are returned immediately to the soil by this process.

The money return per acre from the rye crop, either when hogged off or sold on the market, is not great. When hogged off, this varies with the price of hogs, but will generally be more than if the rye is sold. If the yield of wheat is 20 bushels or more per acre, it is doubtful whether rye should be substituted, but even then the labor situation may force the adoption of rye, together with the hogging-off process.

Corn and clover are most profitably and economically harvested by hogs, and the fertility contained in these crops is thereby returned to the soil with the least possible loss. When these crops are combined with rye and harvested in the same manner, using either a 4, 5, or 6 year rotation, a most efficient farm system for the corn belt is the result. It meets the labor problem, builds up the soil, conserves fertility, and yields a satisfactory income.

The ever-present danger from hog cholera in any system of farming involving swine is fully recognized, but on a number of farms which are using the system here outlined this danger has been successfully obviated by inoculation with hog-cholera serum.

ORGANIZATION OF THE UNITED STATES DEPARTMENT OF AGRICULTURE.

February 4, 1924.

Secretary of Agriculture..... HENRY C. WALLACE.
Assistant Secretary..... HOWARD M. GORE.
Director of Scientific Work..... E. D. BALL.
Director of Regulatory Work..... WALTER G. CAMPBELL.
Director of Extension Work..... C. W. WARBURTON.
Weather Bureau..... CHARLES F. MARVIN, *Chief.*
Bureau of Agricultural Economics..... HENRY C. TAYLOR, *Chief.*
Bureau of Animal Industry..... JOHN R. MOHLER, *Chief.*
Bureau of Plant Industry..... WILLIAM A. TAYLOR, *Chief.*
Forest Service..... W. B. GREELEY, *Chief.*
Bureau of Chemistry..... C. A. BROWNE, *Chief.*
Bureau of Soils..... MILTON WHITNEY, *Chief.*
Bureau of Entomology..... L. O. HOWARD, *Chief.*
Bureau of Biological Survey..... E. W. NELSON, *Chief.*
Bureau of Public Roads..... THOMAS H. MACDONALD, *Chief.*
Bureau of Home Economics..... LOUISE STANLEY, *Chief.*
Office of Experiment Stations..... E. W. ALLEN, *Chief.*
Fixed Nitrogen Research Laboratory..... F. G. COTTRELL, *Director.*
Division of Accounts and Disbursements..... A. ZAPPONE, *Chief.*
Publications..... L. J. HAYNES, *in Charge.*
Library..... CLARIBEL R. BARNETT, *Librarian.*
Federal Horticultural Board..... C. L. MARLATT, *Chairman.*
Insecticide and Fungicide Board..... J. K. HAYWOOD, *Chairman.*
Packers and Stockyards Administration..... } CHESTER MORRILL, *Assistant to the*
Grain Future Trading Act Administration.... } *Secretary.*
Office of the Solicitor..... R. W. WILLIAMS, *Solicitor.*

This bulletin is a contribution from

Bureau of Agricultural Economics..... HENRY C. TAYLOR, *Chief.*
Farm Management and Cost of Production. R. H. WILCOX, *in Charge.*

ADDITIONAL COPIES
OF THIS PUBLICATION MAY BE PROCURED FROM
THE SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE
WASHINGTON, D. C.
AT
5 CENTS PER COPY